FRC 2019 Software and Firmware Setup
(last updated Feb 09, 2019)

Current Versions:
Java 11.0.2
Gradle 5.0
National Instruments FRCUpdate 2019.2.0
Driver Station 19.0
RoboRio 2019_V14
WPILib 2019.4.1
VSCode 1.30.1
Talon SRX Firmware 4.11
PDP 1.4
PCM 1.65
Radio 19.1.1
NavX 3.1.347
Limelight 2019.5.1

INSTALLING DEVELOPMENT SOFTWARE AND DRIVER STATION

Uninstall: (if you have old versions installed)
National Instruments Software (from Apps & features) – select 'Remove All'
Gradle 4.9 (just delete folder – probably at c:\program files\gradle 4.9)
VSCode (install VSCode via the WPILibeInstaller to get FRC templates – uninstall from Apps & features)
Intellij (if you have an older version)
Java (older version of Java such as JDK-8)
CTRE
FRC Radio
navX

Install:
Git
TortoiseGit (optional)
Intellij
Java
Gradle
WPILib (WPILib and VSCode)
FRCUpdateSuite (Driver station - optional)
CTRE.Phoenix.Framework (Lifeboat for updating Talon firmware - optional)
FRC_Radio_Configuration (to update radio firmware and configure radio - optional)
navX
Limelight (update limelight image – optional)

Detail Notes:

GIT
- Git-x.x.x-64-bit
- download installer from: www.git.scm.com/downloads
- double click exe
- accept defaults

TortoiseGit
- TortoiseGit-x.x.x.x-64bit
- download installer from: www.tortoisegit.org/download
- accept defaults

Intellij
- ideaIC-201x.x.x
- download installer from: www.jetbrains.com/idea/download
- use community edition
- check 64bit installer, add Open folder in Project, java
- configure at you like accepting defaults
- when opening a project, check 'Use auto imports' and 'Create directories for …'
- set Gradle Home to c:\program files\gradle-5.0-all\gadle-5.0
- set Gradle JVM to 'Use project JDK (11, …)
- gradle should compile
- allow firewall access

Java
- jdk-xx.x.x_windows-x64_bin
- download installer from: https://www.oracle.com/technetwork/java/javase/downloads/jdk11-downloads-5066655.html
- accept defaults

Gradle
- Gradle-x.x-all
- download folder from: www.gradle.org/install
- click Install Manually
- click download
- complete v5.0 complete
- copy gradle-5.0-all folder into c:\program files\

FRC Update Suite (National Instruments - driver station)
- FRCUpdateSuite_201x.x.x.zip
- make sure your PC has a connection to the Internet as the software will need to activate the license
- download zip from: http://www.ni.com/download/first-robotics-software-2017/7904/en/
- double click setup.exe
- accept defaults
- enter you name and team1619 for the organization
- enter B04P63221 for the serial number
- accept license agreements

- run license manager to active the products
- log into your account. If you don't have one, just set one up.
- click [Activate]
- restart computer

Serial Number: B04P63221
Product: Vision Runtime
Version: 18.0
Activation Code: MYMN-PXBH-BQ2X-PR6B-9CZL
Computer ID: 8223-GFGD-2XNX-BQMD

WPILib and VSCode
- WPILibInstaller_Windows64-2019.x.x.zip
- download zip from https://github.com/wpilibsuite/allwpilib/releases
- double click exe
- click [All Users]
- click [Select/Download VS Code]
- click [Download]
- uncheck C++ Compiler
- make sure Visual Studio Code, Gradle, and Java JDK/JRE are checked
- leave Tools and Utilities, WPILib Dependencies, and Visual Studio Code Extensions checked
- click [Execute Install]

CTRE (talons)
- CTRE.Phoenix.Framework.vx.xx.x.x
- download zip from: http://www.ctr-electronics.com/hro.html#product_tabs_technical_resources
- instructions at https://phoenix-documentation.readthedocs.io/en/latest/ch05_PrepWorkstation.html
- double click CTRE.Phoenix.Framework.vx.xx.x.x.exe
- accept defaults
- click [install] with [] trust… checked

Radio
- FRC_Radio_Configuration_xx_x_x
- download installer from: https://wpilib.screenstepslive.com/s/currentCS/m/getting_started/l/144986-programming-your-radio
- double click FRC_Radio_Configuration_xx_x_x.exe
- accept defaults
- allow WinPCap to be installed
- accept defaults

navX
- navX x.x.xxx
- download https://www.kauailabs.com/public_files/navx-mxp/navx-mxp.zip
- run setup.exe
- this will install the naxXUI, navXFirmwareUpdater, navXConfig, and navXMagCalibrator
- to update the firmware, you might need to replace the ST files

Updating Limelight Firmware:

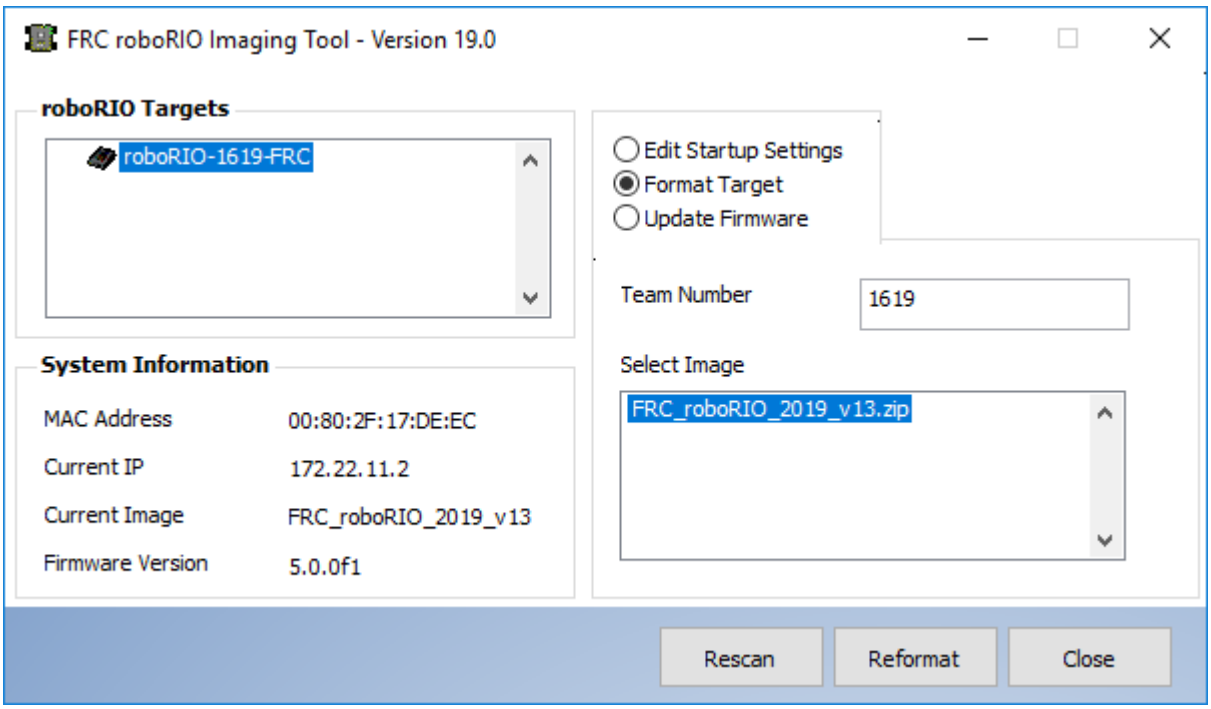
- Instructions at http://docs.limelightvision.io/en/latest/getting_started.html#imaging
- Download Bonjour, USB drivers, New Flash Tool for 2019 and image at: https://limelightvision.io/pages/downloads

UPGRADING ROBOT FIRMWARE:

Roborio:

Run - roboRIO Imaging Tool.exe

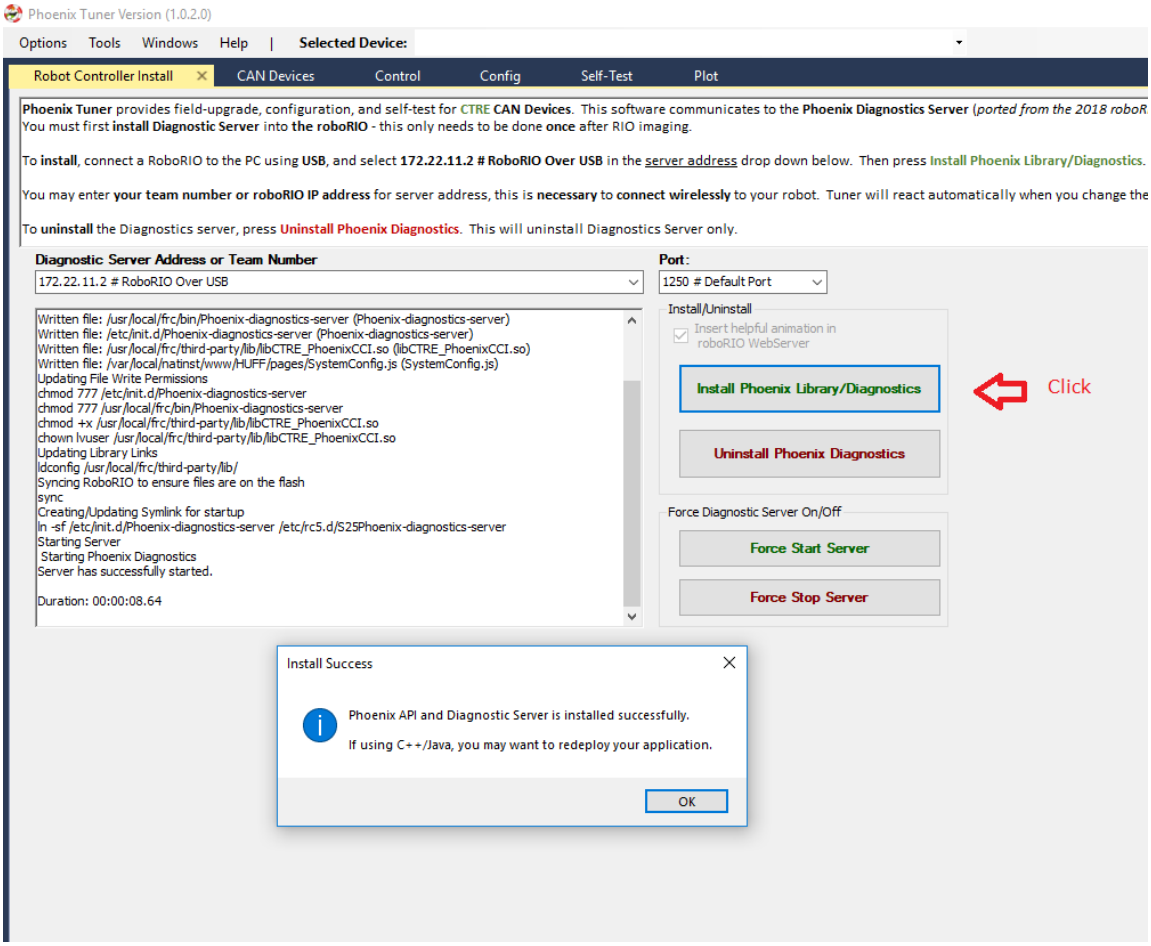
Set up as shown below and click [Reformat]



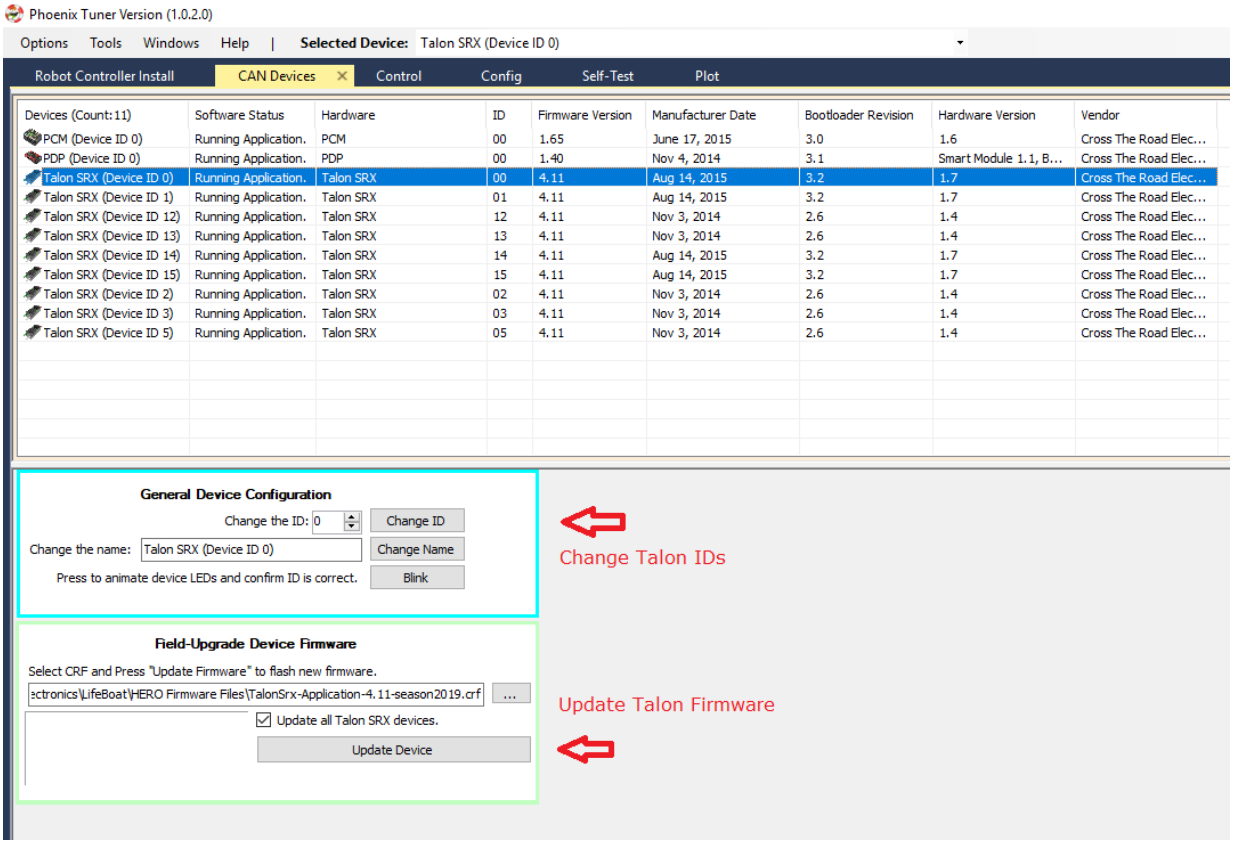
Talons, PDP, and PWM:

Connect USB cable from PC to RoboRio
Run - Phoenix Tuner.exe

Click [Install Phoenix Library/Diagnostics]

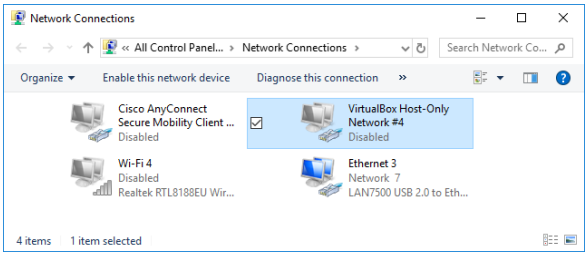


Click the [CAN Devices] tab
Select Talon
Change ID and click [Change ID)
Select device, select firmware file, and click [Update Devices]
(you can update all Talons at once by checking [] “Update all Talon SRX devices”)
Talon = TalonSrx-Application-4.11-season2019.crf
PDP = PDP-Application-1.40.crf
PWM = PCM-Application-1.65.crf

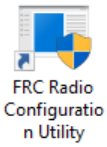


Radio:

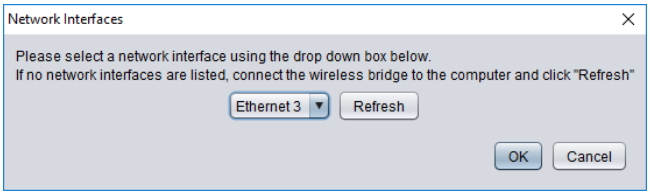
Disable Wifi adapters and extra LAN adapters so you only have one Ethernet adapter enabled



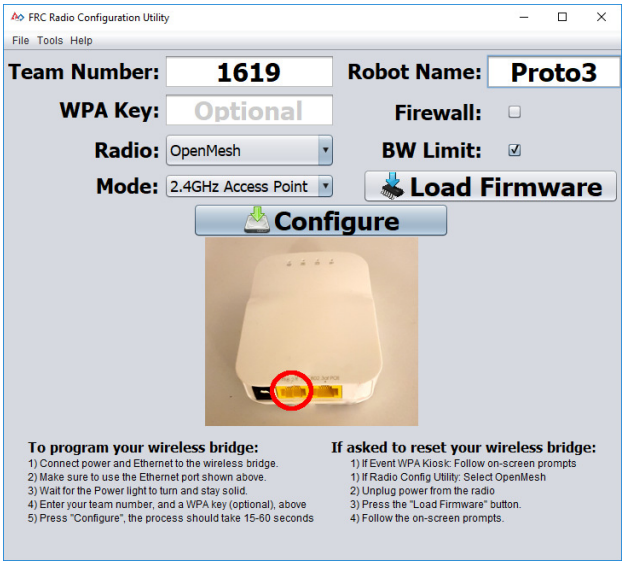
Connect Ethernet cable from PC to Radio
Power Radio either with a separate adapter or by turning on the robot
Run - FRC Radio Configuration Utility.exe

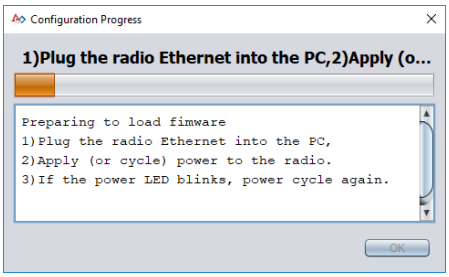


Select the single LAN connection that is connecting the Radio to the PC

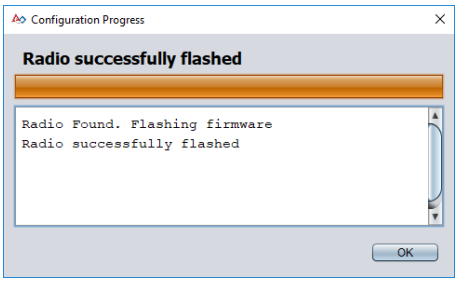


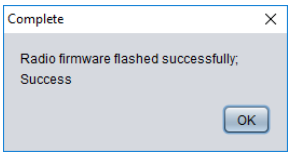
Enter the Team Number
Enter the Robot Name
Click [Load Firmware]



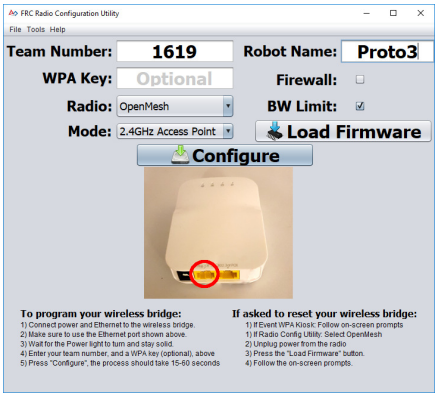


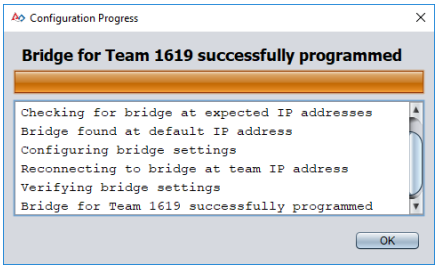
Unplug power from Radio and plug it back in to power cycle the radio.

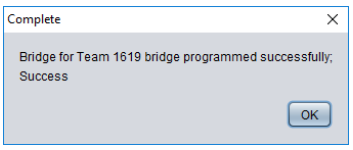




Click [Configure]



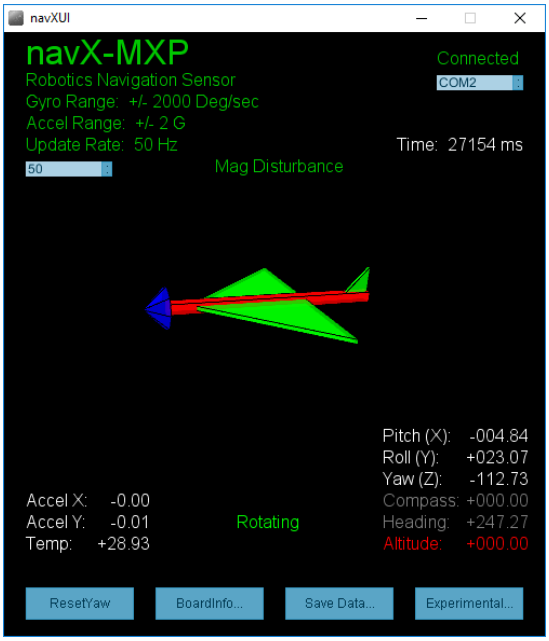




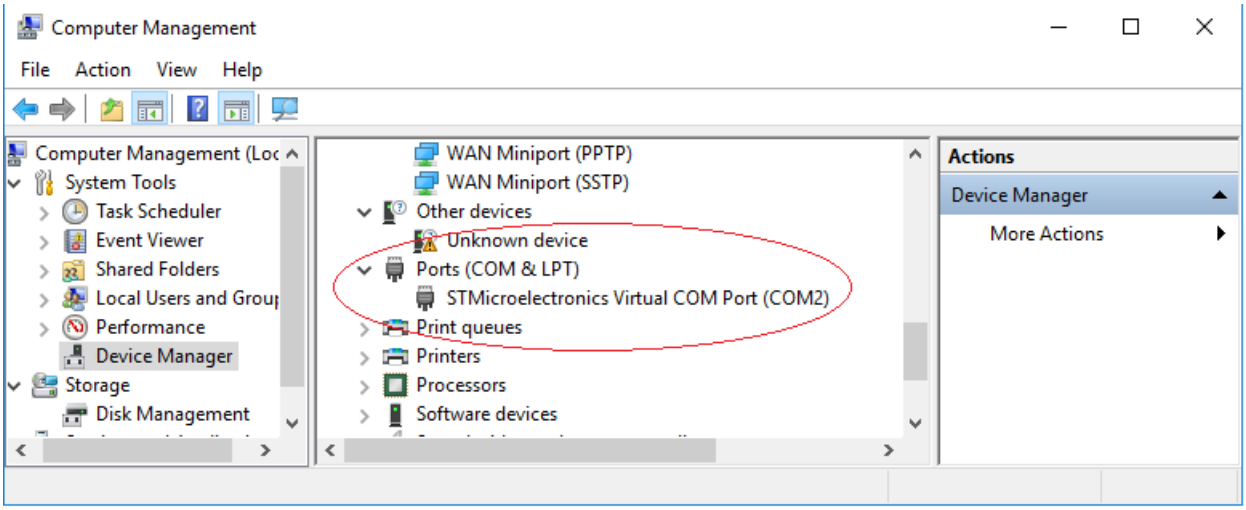
navXUI:

– This is a UI that shows the values read from the navX

- Connect navX to PC via USB cable
- Run navXUI



If you are not connecting to the navX, check the USB driver



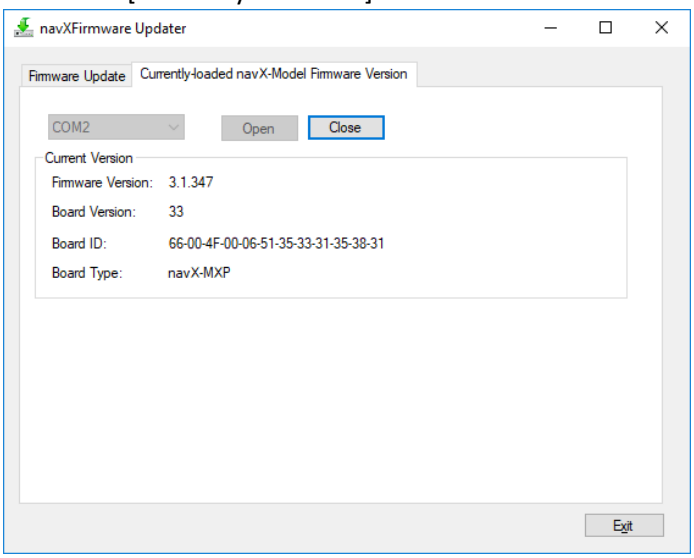
If you do not see the navX as a COM Port, try running VCP_V1.5.0_Setup_W8_x64_64bits.

navX Calibrating

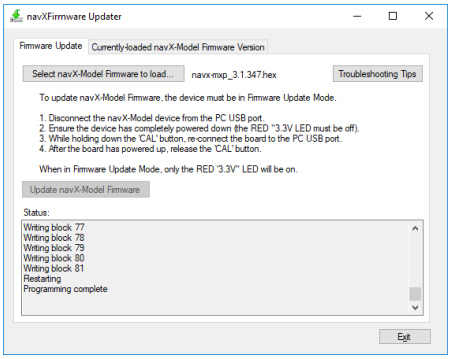
- The navX needs to be calibrated when placed into a new orientation
- Place board in the desired orientation
- Power up navX,
- Hold down Cal button on the board for 5 seconds
- Let go of the button
- The red light in front of button should blink on and then off
- Press and release the reset button on the board
- The two green lights should blink off and then on

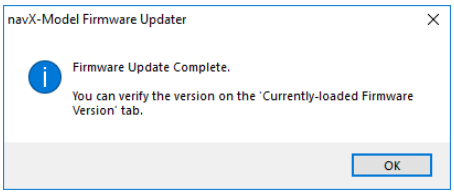
navX Firmware Updater:

- Run navXFirmwareUpdater
- Connect the navX to the PC with a USB cable
- Click the [Currently-loaded …] tab to see the current firmware version



- Click the [Firmware Update]
- Click [Select navX-Model Firmware to load]
- Select C:\Users\username\navx-mxp\firmware\navx-mxp_3.1.347.hex
- Unplug navX from USB cable
- Hold down the cal button on the navX board while plugging it back into the USB cable
- Release Cal button
- Click [Update navX-Model Firmware]

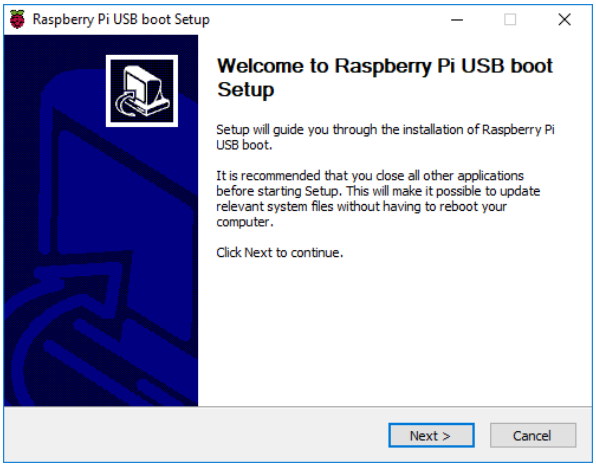




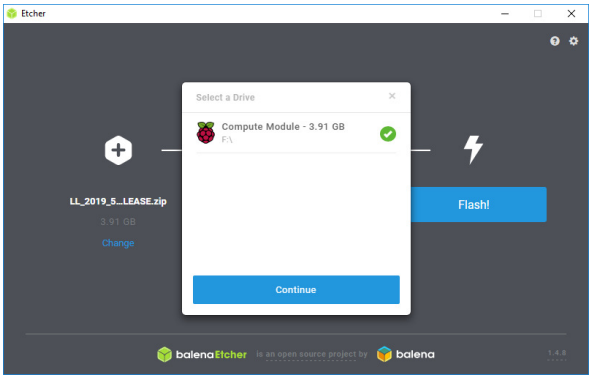
Updating Limelight Firmware:

- Instructions at http://docs.limelightvision.io/en/latest/getting_started.html#imaging
- Download Bonjour, USB drivers, New Flash Tool for 2019 and image at:
https://limelightvision.io/pages/downloads
- Install Bonjour if needed
- Install USB drivers
- Do not use a Windows 7 machine.
- Remove power from your limelight.
- Unplug any secondary camera from the Limelight USB port. (flash tool will not see drive otherwise)
- Run a USB-MicroUSB cable from your laptop to your limelight.
- Apply power to your limelight.
- Run “Balena Etcher”.(balenaEtcher-Portable-1.4.8-x64.exe)
- It may take up to 20 seconds for your machine to recognize the camera.
- Select the latest .zip image in your downloads folder
- Select a “Compute Module” device in the “Drives” menu
- Click “Flash”
- Once flashing is complete, remove power from your limelight

USB Drivers:



Flash image:



Logger

Disable: log4j2.xml -> comment out

```
<AppenderRef ref="AsyncFileLogger" level="ALL"/>
```

Get/Delete files on RoboRio (no password)